APR/FY06

TRIPLER ARMY MEDICAL CENTER

Hawaii

Army Defense Environmental Restoration Program Installation Action Plan

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Statement of Purpose

The purpose of the Installation Action Plan (IAP) is to outline the total multi-year Cleanup Program for an installation. The plan identifies environmental cleanup requirements at each site or area of concern, and proposes a comprehensive, installation-wide approach, with associated costs and schedules, to conduct investigations, necessary remedial actions.

In an effort to coordinate planning information between the restoration manager, U.S. Army Environmental Center (USAEC), Tripler Army Medical Center, Installation Management Agency-Pacific Area Regional Office (IMA-PARO), executing agencies, regulatory agencies, and the public, an IAP was completed. The IAP is used to track requirements, schedules, and budgets for all Army installation cleanup programs.

All site-specific funding and schedule information has been prepared according to projected overall Army funding levels and is therefore subject to change.

The following persons contributed to the formulation and completion of this Installation Action Plan during a planning workshop held on 24 - 27 April 2006:

Company/Installation/Branch

US Army Environmental Center
SBooz Allen for US Army Environmental Center
EEI for US Army Environmental Center
EEI for US Army Garrison Hawaii
US Army Garrison Hawaii
ICI for US Army Environmental Center
DIMCO for US Army Engineer Research and Development Center
State of Hawaii Department of Health, HEER Office

Acronyms & Abbreviations

AEDB-R Army Environmental Database - Restoration

AOC Area of Concern

BRAC Base Realignment & Closure Act

CERCLA Comprehensive Environmental Response, Compensation, and

Liability Act

CTC Cost-To-Complete
DA Department of the Army

DCE dichloroethylene

DERA Defense Environmental Restoration Account (currently called

ER,A)

DERP Defense Environmental Restoration Program

DOD Department of Defense
DOH Department of Health
DPW Directorate of Public Works

DSERTS Defense Site Environmental Restoration Tracking System

DSMOA Defense/State Memorandum of Agreement

EPA Environmental Protection Agency

ER,A Environmental Restoration, Army (formerly called DERA)

FFA Federal Facilities Agreement

FIT Field Inspection Team
FS Feasibility Study
FY Fiscal Year

IAP Installation Action Plan
IAW In accordance with

IMA-PARO Installation Management Agency-Pacific Area Regional Office

IRA Interim Remedial Action

IRP Installation Restoration Program
KMR Kahauiki Military Reservation

LUST Leaking Underground Storage Tank

LTM Long-Term Management
MC Munitions Constituents
MCL Maximum Contaminant Level

MMRP Military Munitions Response Program

msl mean sea level

NCO Non Commissioned Officer

NE Not Evaluated
NFA No Further Action

NFRAP No Further Remedial Action Planned

NPL National Priority List

OU Operable Unit

PA Preliminary Assessment
PBC Performance Base Contract
PCB Polychlorinated Biphenyls

PCE Tetrachloroethylene

Acronyms & Abbreviations

POL Petroleum, Oil & Lubricants

ppb Parts per billionRA Remedial Action

RA(C) Remedial Action – Construction RA(O) Remedial Action - Operations RAB Restoration Advisory Board

RC Response Complete

RCRA Resource Conservation and Recovery Act

RD Remedial Design REM Removal Action

RI Remedial Investigation
RIP Remedy in Place
ROD Record of Decision

RRSE Relative Risk Site Evaluation
SB Schofield Army Barracks
SDWA Safe Drinking Water Act

Site Inspection

SVOC Semi-Volatile Organic Compounds

TAL Target Analyte List

TAPP Technical Assistance for Public Participation

TBA Tert-Butyl Alcohol
TCE Trichloroethylene
TCL Target Compound List
TI Technical Impracticability
TRC Technical Review Committee
TSCA Toxic Substance Control Act

USAEC United States Army Environmental Center USAEHA U.S. Army Environmental Hygiene Agency

USAG-HI U.S. Army Garrison-Hawaii

USATHAMA U.S. Army Toxic and Hazardous Materials Agency

USCOE-HED U.S. Corps of Engineers-Honolulu

USTUXOVOAVOCUnderground Storage TankUnexploded OrdnanceVolatile Organic AnalysisVolatile Organic Compounds

WAAF Wheeler Army Airfield

Installation Information

Installation Locale: The Tripler Army Medical Center (TAMC) is located 4.5 miles northwest of downtown Honolulu on the island of Oahu, State of Hawaii. The military-operated hospital and support facilities cover an area of 367 acres that varies in elevation from 190 to 665 feet. It is located on the southwestern end of the Koolau Mountain Range on moderate to steeply sloping land between Moanalua and Kamananui Streams.

Installation Mission: Tripler Army Medical Center's mission is to train, equip, and to sustain the Army forces for the Pacific Theater.

Lead Organization: Installation Management Agency – Pacific Region

Lead Executing Agency: US Army Corps of Engineers, Pacific Division

Regulatory Participation:

State: Hawaii Department of Health

National Priorities List (NPL) Status: Non-NPL

Installation Restoration Advisory Board (RAB)/Technical Review Committee (TRC)/Technical Assistance for Public Participation (TAPP) Status:

No RAB/TRC/TAPP has been established at this time.

Technical Review Committee/Restoration Advisory Board Status: None

Installation Program Summaries IRP

Primary Contaminants of Concern: POL

Affected Media of Concern: Groundwater, Soil, Surface Water

Estimated Date for Remedy-In-Place (RIP)/Response Complete (RC): 2009/2017

Funding to date (up thru FY05): \$ 8,329,900 Current year funding (FY06): \$ 1,284,800 Cost-to-Complete (FY07+): \$10,918,000

MMRP

There are no MMRP sites at Tripler Army Medical Center.

BRAC

There are no BRAC sites at Tripler Army Medical Center

CC

There is one CC site at Tripler Army Medical Center.

Cleanup Program Summary

Installation Historic Activity

Tripler Army Medical Center (TAMC) is an active U.S. Army Medical Facility. This facility serves the active and retired members of the Armed Services and their dependents, pets, U.S. Coast Guard, Commissioned Corps of the Coast and Geodetic Survey, Commissioned Corps of the Public Health Service, Veterans Administration Beneficiaries, and other eligible personnel authorized by Army Regulation 40-3.

TAMC was originally constructed in 1907 at Fort Shafter. Following World War II, it became apparent that the existing facilities were inadequate to serve patient needs. In 1944 a new site was selected, and construction began at its present location. In 1948, the new facilities were complete, and TAMC became the largest medical facility of the time. The Veterans' Administration (VA) has also built a center for aging on the sub-installation in 1997 and is in the process of constructing an addition to the existing hospital to service veterans.

The land uses of the area surrounding this sub-installation are residential and recreational (golf course) on the west, Aliamanu Military Reservation (AMR), a military housing installation, on the southwest across the H-1 Freeway, and the Red Hill Naval Housing Area/Fuel Storage Area, and Kaiser Permanente Moanalua Medical Center to the northwest across Moanalua Stream. To the north lie heavily forested areas of the Koolau Mountain Range.

IRP Prior Year Progress:

There are two current and active sites under the IRP program at Tripler Army Medical Center. There are no active or proposed sites under the MMRP program.

The two on-going IRP sites are the Building 125 site (TAMC-04) and the Tripler Army Medical Center dump site (TAMC-02). A RI report was prepared summarizing on-going investigative work from 2000 through 2004 was submitted to the State of Hawaii Department of Health in July 2005 and was reviewed. Additional site assessment work, remedial design, and remedial action is included in the Performance Based Contract (PBC) and is planned for Fiscal Year 2007. The contractor has submitted a proposed workplan for the SI effort on the Building 125 site that is presently under review by State of Hawaii DOH.

At the Tripler Army Medical Center dump site, a series of large storms in late 2003 washed out a portion of a storm drainage system located adjacent to the site. Some of the protective synthetic liner and soil cover were exposed along the edge of the site.

A temporary repair was completed in August, 2005 to prevent the dump site contents from being further exposed. Construction of the Phase I storm drain restoration has been completed. Final walk through is planned. Phase II design is almost complete and construction is planned in FY07.

Cleanup Program Summary

IRP Future Plan of Action:

Phase II construction is planned for FY07 to include road improvement and access to the landfill. Because no Record of Decision has been prepared for TAMC-02 (dump site), a post closure Record of Decision will be prepared in FY07. TAMC-02 also has LTM requirements currently planned through 2037, to include groundwater monitoring and site cap maintenance. LUC restrictions for both TAMC-02 and TAMC-04 (Bldg 125) will be prepared in FY07. TAMC-04 is planned for RC in FY07.

TRIPLER ARMY MEDICAL CENTER

Installation Restoration Program



Total AEDB-R IRP Sites / AEDB-R sites with Response Complete: 8/6

Different Site Types:

1 Contaminated Sediment
 4 Underground Storage Tank
 1 Soil Contamination after Tank Removal

Most Widespread Contaminants of Concern: POL, Pesticides, Solvents

Media of Concern: Groundwater, Soil, Surface Water

Completed Removal (REM)/Interim Remedial Action (IRA)/Remedial Action (RA):

REM - Underground Storage Tank Removal (FY93-94) Cost: \$ 135.0K REM - Pesticide Storage Area (FY93-94-95-96) Cost: \$1,346.0K REM - PCB Transformer Station (FY93-94-95) Cost: \$ 696.2K

Total IRP Funding

Prior years (up thru FY05): \$ 8,329,900 Current year funding (FY06): \$ 1,284,800 Future Requirements (FY07+): \$10,918,000 Total: \$27,571,700

Duration of IRP

Year of IRP Inception: 1991 Year of IRP RIP/RC: 2009

Year of IRP Completion including LTM: 2037 with indefinite LUCs

IRP Contamination Assessment

IRP Contamination Assessment Overview

Investigations at TAMC were initially conducted in 1983 through 1984 as part of the Army's installation assessment program. No significant sources of contamination were identified and no further action was recommended.

In August 1990, the US Army Toxic and Hazardous Material Agency (USATHAMA) conducted an assessment to establish baseline data for potential waste sites (Reference 3, Table 1). Waste sites were broadly defined as locations from which hazardous constituents might be released into the environment, regardless whether the material is solid or hazardous waste. The report identified 19 potential hazardous waste sites at TAMC. Although the report did not differentiate between sites that are eligible for Defense Environmental Restoration Account (DERA) funds under the IRP, it did form the basis of sites listed in the Army Environmental Database - Restoration (AEDB-R) database.

Since 1992, the US Army Corps of Engineers, Pacific Ocean Division (POD) have been conducting investigations and removals at various sites identified in the USATHAMA Property Report. They include DSERTS sites TAMC-01 through 07. The primary contaminants of concern were POL, heavy metals, and pesticides. No further response actions planned (NFRAP) were recommended for sites TAMC-01, 03, -05, -06 and -07 following expedited removal actions. Removal of contaminated soils at the building 145 UST site (TAMC-11) was completed in 1999.

In June 1994, the US Army Environmental Hygiene Agency conducted a site assessment on the remaining sites identified in the USATHAMA property Report. The purpose of the site assessment was to determine the potential threat to human health and the environment, and to identify any waste sites needing a Site Investigation (SI) would be DERA eligible. The PA recommended NFRAP RC for all of the remaining sites. After review of the PA recommendations, however, several sites were added to the list requiring further investigation.

A contract was solicited by DPW through the Corps of Engineers, Pacific Ocean Division, to conduct a PA at four additional sites (TAMC-08, -09, -10 & -12) in September, 1994. The final PA dated December 1995, recommended NFRAP RC for the four sites.

The Remedial Investigation for the Former dump site (TAMC-02) was completed in May 1998. The Feasibility Study report was finalized in February 1999. The remedial design/remedial action project was initiated in 1999, and the design was completed in 2000. An Operations and Maintenance Plan is pending regulatory approval although a Record of Decision has not yet been done for the site.

The Remedial Investigation of the former building 125 UST (TAMC-04) site was initiated in 1999 and is currently on-going. A RI report was prepared and submitted to the State of Hawaii Department of Health in July 2005 which summarized investigative work from 1999 through 2004. Additional site assessment work, remedial design, and remedial action is included in the Performance Based Contract (PBC) and is planned for Fiscal Year 2007.

IRP Contamination Assessment

At the Tripler Army Medical Center dump site, a series of large storms in late 2003 washed out a portion of a storm drainage system located adjacent to the site. Some of the protective synthetic liner and soil cover were exposed along the edge of the site

A temporary repair was completed in August, 2005 to prevent the dump site contents from being exposed. Construction of the Phase I storm drain restoration has been completed. A final site walk through is planned. Phase II design is almost complete and construction is planned for FY07.

Cleanup Exit Strategy:

Phase II construction is planned for FY07 to include road improvement and access to the landfill. Because no Record of Decision has been prepared for TAMC-02 (dump site), a post closure Record of Decision will be prepared in FY07. TAMC-02 also has LTM requirements currently planned through 2037, to include groundwater monitoring and site cap maintenance. LUC restrictions for both TAMC-02 and TAMC-04 (Bldg 125) will be prepared in FY07. TAMC-04 is planned for RC in FY07.

1984

- Installation Assessment of US Army Support Command, Hawaii, Installations Volume I: Fort Shafter and Subinstallations: Tripler Army Medical Center, Fort Kamehameha, and Kapalama Military Reservation, Oahu, Hawaii, Report No. 338. Prepared by Environmental Science and Engineering, Inc.
- Installation Assessment of U.S. Army Support Command, Hawaii. Prepared for the US Army Toxic and Hazardous Materials Agency, Aberdeen Proving Ground, Maryland, prepared by Roy F. Weston, Inc.

1990

 Property Report. Prepared for US Army Toxic and Hazardous Materials Agency, Aberdeen Proving Ground, Maryland prepared by Roy F. Weston, Inc.

1992

 Testing for Polychlorinated Biphenyl (PCB) Contamination, Tripler Army Medical Center, Honolulu, Oahu, Hawaii. Prepared for U.S. Army Corps of Engineers, Pacific Ocean Division, Fort Shafter, Hawaii, by Brewer Environmental Services, Aug.

1993

- Chemical Data Acquisition Plan for Remediation of Pesticide Contaminated Soil at Building 114, Tripler Army Medical Center, Oahu, Hawaii. Prepared for US Army Corps of Engineers, Pacific Ocean Division, Fort Shafter, Hawaii by Ocean Division, Fort Shafter, Hawaii by Clayton Environmental Consultants, Nov.
- Remediation Action Work Plan for Remediation of Pesticide Contaminated Soil at Building 114, Tripler Army Medical Center, Oahu, Hawaii. Prepared for US Army Corps of Engineers, Pacific Ocean Division, Fort Shafter, Hawaii by Ocean Division, Fort Shafter, Hawaii by Clayton Environmental Consultants, Nov.

1994

• Site Assessment No. 38-26-K28U-94, Waste Sites at Army Properties, Hawaii. Prepared for USARPAC and USAG-HI by U.S. Army Environmental Hygiene Agency, Jun.

1995

 Final Interim Preliminary Assessment Report Various Sites at Tripler Army Medical Center, Honolulu, Oahu, Hawaii, for US Army Engineer District Honolulu prepared by Dames & Moore, Dec.

1996

 Preliminary Field Screening Investigation, Tripler Army Medical Center Unapproved dump site, Oahu, Hawaii. Prepared for US Army Garrison, Hawaii by Brewer Environmental Services, Oct.

1998

 Comprehensive Field Investigation, Tripler Army Medical Center Landfill, Oahu, Hawaii. Prepared for US Army Garrison, Hawaii by Brewer Environmental Services, May.

1999

 Remedial Alternatives and Feasibility Study, Tripler Army Medical Center Landfill, Oahu, Hawaii. Prepared for US Army Garrison, Hawaii by Brewer Environmental Services, Feb.

2000

• Tripler Army Medical Center Landfill Final Closure Specifications. Prepared by Environmental Chemical Corporation, Aug.

2001

 Draft Site Characterization, Tripler Army Medical Center, Oahu, Hawaii. Prepared for US Army, Garrison, Hawaii by Edward K. Noda and Associates, Jun.

2004

- Site Characterization and Risk Assessment, Former Building 125 USTs, Tripler Army Medical Center, Oahu, Hawaii. Prepared for U.S. Army, Garrison, Hawaii by Edward K. Noda and Associates, Jul.
- Erosion Control Assessment of Closed Landfill, Tripler Army Medical Center (TAMC). Prepared by Parsons, Brinckerhoff, Quade, and Douglas, Inc. Jul.

2005

 Final Emergency Response Action Completion Report (TAMC-02), Tripler Army Medical Center, Oahu, Hawaii. 13 Oct 2005. Prepared by Versar, Inc. Prepared for: US Army Environmental Center, Aberdeen Proving Grounds, Maryland.

2006

- Drainage Improvements Tripler Army Medical Center Landfill, Oahu, Hawaii. 02
 Feb 2006. R.M. Towill Corporation. Prepared for US Army Corps of Engineers,
 Honolulu Engineer District.
- Geotechnical Engineering Exploration FY05 Project, Drainage Improvements.
 Tripler Army Medical Center, Oahu, Hawaii. 09 Jan 2006. Prepared by Geolabs, Inc. Prepared for R.M. Towill Corporation and US Army Corps of Engineers, Honolulu Engineer District.
- Final Project Work Plan, Landfill Liner Restoration, Tripler Army Medical Center, Oahu, Hawaii. Prepared by Myounghee Noh and Associates, Prepared for US Army Corps of Engineers. Oct.

TRIPLER ARMY MEDICAL CENTER

Installation Restoration Program
Site Descriptions

TAMC-02 TAMC DUMP SITE (SW BORDER)

SITE DESCRIPTION

Former Dump Site located in the southwestern portion of the installation. Dumping at the unapproved site (2 hectare in size) occurred from 1960 to 1973. The type of waste reportedly varied from incinerator ash, laboratory wastes, oil/solvent, and miscellaneous items from TAMC and Fort Shafter.

An investigation conducted from 1996 until 1998 determined that pesticides and other contaminants were present in the groundwater at the site.

In 2000 an HDPE liner system was placed over the dump site.

In late 2003 a series of large storms washed out part of an adjacent storm drain system and eroded the southwestern edge of the dump site cap, exposing the membrane liner. Phase I of the storm drainage re-construction has been completed. Phase II is scheduled for FY07.

STATUS

REGULATORY DRIVER: CERCLA

RRSE: High

CONTAMINANTS OF CONCERN: POL, SVOCs, Pesticides, Dioxins,

Metals

MEDIA OF CONCERN:

Groundwater, Surface Water

<u>PHASES</u>	<u>Start</u>	<u>End</u>
PA	198306	198408
SI	198306	198408
RI	199210	199810
RD	199811	200009
RA(C)	199811	200205
LTM	200209	203709

RC DATE: 200205

CLEANUP STRATEGY

Phase II construction is planned for FY07 and includes road improvement and access to the landfill. Because no Record of Decision has been prepared for TAMC-02 (dump site), a post closure Record of Decision will be prepared in FY07. TAMC-02 also has LTM requirements currently planned through 2037, that include groundwater monitoring and site cap maintenance. LUC restrictions for TAMC-02 will be prepared in FY07.

SITE DESCRIPTION

Following the removal of a diesel UST at former 125. free product building contamination of the soil were identified in the excavation pit which showed that the lateral extent of contamination exceeded the initial excavation limits. As a result an IRA was conducted in 1994 by PRC Environmental where 3,716 cubic yards of contaminated soil was removed. Thermal desorption was conducted offsite in 1995 to remediate the contaminated soil. The report has been submitted to the State of Hawaii Department of Health.

Further investigation to define the extent of contamination to determine the risk to human health and the environment is required.

The PBC contractor has submitted a proposed workplan for the RI effort on the Building 125 site that is presently under review by State of Hawaii DOH. The goal is to have the site RC under the PBC contract by FY07.

STATUS

REGULATORY DRIVER: CERCLA

RRSE: Low

CONTAMINANTS OF CONCERN:

POL

MEDIA OF CONCERN:

Groundwater

<u>PHASES</u>	Start	<u>End</u>
PA	198306	198408
SI	199207	199212
IRA	199310	199412
RI	199908	200709
RD	200710	200806
RA(C)	200806	201009
LTM	201009	201609

RC DATE: 201009

CLEANUP STRATEGY

Any additional work will be determined by the PBC contractor subject to Army and regulatory approval. Additional investigation will be conducted to gain a better understanding of the site. A remedy will be recommended following the additional investigation work. Groundwater monitoring will be conducted for five years following RC. After five years of monitoring, a determination will be made if further sampling will be required.

IRP No Further Action Sites Summary

AEDB-R#	Site Title	Documentation/Reason for NFA	NFA Date
TAMC-01	Bldg 114 Pesticide UST (WSC #6)	All Required Cleanups Completed	199412
TAMC-03	Bldg 114 Pesticide Storage (WSC #7)	, , , , , , , , , , , , , , , , , , , ,	
TAMC-05	UST @ Bldg 113 (WSC #8)	Removal of Underground Fuel Storage Tanks, Tripler Army Medical Center, Site 113-9, 10, &SP, Morrison Knudsen Corporation, May 1995	199510
TAMC-06	Old Transformer Substation	All Required Cleanups Completed	199512
TAMC-07	UST Wing B	All Required Cleanups Completed	199412
TAMC-11	UST Bldg 145 (AAFES)	Removal of Underground Fuel Storage Tanks, Tripler Army Medical Center, Site 145-3, Morrison Knudsen Corporation, Dec 1994	199412

Initiation of IRP: 1991

Past Phase Completion Milestones

The schedule of IRP work completed to date and planned through completion of all restoration work at Tripler has been detailed.

1992	
REM/RA (TAMC-01 & 03) Initiated RA (TAMC-06) Initiated RI/FS (TAMC-02) Initiated	Oct Oct Oct
1993	
REM (TAMC-04, 05, & 07) Initiated	Oct
PA (AEHA) Initiated	Nov
1994	
PA (AEHA) Completed	Jun
PA/SI (TAMC-08, 09, & 10) Initiated	Oct
REM/RA (TAMC-01 & 03) Completed	Dec
RA (TAMC-06) Completed	Dec
REM (TAMC-04, 05, & 07) Completed '	Dec
1995	
PA (TAMC-08, 09, & 10) Completed	Dec
1998	
RD/RA (TAMC-02) Initiate	Jul
1999	
RI/FS (TAMC-02) Completed	Feb
RI (TAMC-04) Initiate	Sep
2000	
RD (TAMC-02) Complete	Aug
2002	
RA (TAMC-02) Complete	May
RI (TAMC-04) Complete	May
	,
LTM* (TAMC-02) Initiate	Jun
RA Complete (TAMC)	Jun Dec
,	Jun

Projected Record of Decision (ROD)/Decision Document (DD) Approval Dates: 2007

Projected Construction Completion Date of IRP: 200909

Schedule for Next Five-Year Review: 2014

Estimated Completion Date of IRP (including LTM phase): Indefinite



Prior Years Funds

Total Funding up to FY04: \$7,039K

Year Site Information Expenditures FY Total

FY 05 LTM, TAMC-02 922,530

LTM, TAMC-04 368,410 **\$1,290.9K**

Total Prior Years Funding: \$8,329.9K

Current Year Requirements

Year Site Information Expenditures FY Total

FY06 LTM, TAMC-02 693,170

RI, TAMC-04 591,630 **\$ 1,284.8K**

Total Funding FY06: \$1,284.8K

Total Future Requirements: \$10,918K

Total IR Program Cost (from inception to completion of the IRP): \$ 27,571.7K

Community Involvement

Efforts Taken to Determine Interest

A public meeting was held in November 2000 in relationship to the dump site cap project. Flyers were posted and hand delivered to neighborhood residences, announcements were made in the local television stations and newspapers.

Results

Only two people from the public attended.

Conclusions

To date very little public interest has been shown in the program. This along with the results from earlier Aliamanu meetings also points to a general lack of interest.

Follow-up Procedures

The installation will continue to gauge public interest through individual meetings on projects. Solicitation for interest will be conducted in FY07.